

**LIGHT WEIGHT SIGNAL TRANSMISSION LINES AND RADIO
FREQUENCY ANTENNA SYSTEM**

5 A light weight antenna system and corresponding lightweight
transmission lines are disclosed that are characterized as having an
extremely light weight relative to prior such systems and lines. An inflatable
body having an inner surface connected to an outer surface with a plurality of
support structures, such as connecting tubes. Antenna elements are
10 disposed on the outer surface of the inflatable body to form, for example, a
phased array antenna. Coaxial transmission lines are used to transmit
signals to and from an antenna element and are, in one embodiment, created
by disposing an inner conductor within the aforementioned connecting tubes.
Such a transmission line may be utilized in a number of applications, such as
15 to connect a base station to an antenna system of a wireless communications
network. In another embodiment, quasi coaxial transmission lines are formed
by disposing flexible membrane shields around a transmission elements.